# Sodium metabisulFite

| CAS number: | 7681-57-4 |
| --- | --- |
| Synonyms: | Disodium disulphite, sodium pyrosulfate, sodium metabisulphite |
| Chemical formula: | Na2S2O5 |
| Structural formula: | — |

 Workplace exposure standard (retained)

| TWA: | **5 mg/m3** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
|  Notations: | **—** |
| IDLH: | **—** |
| **Sampling and analysis**: The recommended value is quantifiable through available sampling and analysis techniques.  |

## Recommendation and basis for workplace exposure standard

A TWA of 5 mg/m3 is recommended to protect for irritation of the upper respiratory tract and mucous membrane in exposed workers.

Given the limited data available from the primary sources, it is recommended that a review of additional sources be conducted at the next scheduled review.

## Discussion and conclusions

Sodium metabisulphite is primarily used as a food preservative and as an antioxidant.

Critical effects of exposure are irritation of the upper respiratory tract (URT) and mucous membrane.

Limited data exists from both human and animal studies. ACGIH (2018) extrapolated a 7 mg/m3 NOAEC from a two-year feeding study in rats exposed at 0.215% (intake source not provided). URT and mucous membrane irritation was reported in an inhalation study in dogs exposed at 1 mg/m3 for 290 days (NICNAS 2013).

Given the contradictory exposure data in the two studies, the TWA of 5 mg/m3 by ACGIH is recommended to be retained to limit irritant effects in exposed workers. It is recommended that a review of additional sources be conducted at the next scheduled review.

## Recommendation for notations

Not classified as a carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Not classified as a skin sensitiser or respiratory sensitiser according to the GHS.

A skin notation is not recommended based on the available evidence.

# Appendix

### Primary sources with reports

| Source Year set Standard  |
| --- |
| SWA 1991 TWA: 5 mg/m3 |
|  |
| ACGIH 2001 TLV-TWA: 5 mg/m3 |
| TLV-TWA recommended to minimise the risk of irritation of the URT and mucous membranes in exposed workers.Summary of data:Human data:* 2 cases of occupational asthma reported in laundry workers (exposure pathway and concentration not noticed)
* A woman (67 yr of age) reported severe asthma after eating salad with vinegar dressing containing sodium metabisulphite.

Animal data:* LD50: 115 mg/kg (rats, oral); primary response was irritation of the URT
* Exposure at 0.6% solution (rats, 5–7 wk, oral) was associated with reduced body weight gain caused by thiamine deficiency
* Exposure at 0.215% (rats, 2 yr, oral) produced no adverse effects (no information provided on intake source):
* extrapolation of data to humans, with a 100-fold UF and assuming equivalent bioavailability, results in an equivalent air concentration of 7.0 mg/m3
* Exposure at 0.7, 1.5, 3, 6, and 13 mmol/kg/d (rats, 3 gen, oral):
* reduced body weight gain observed in F1 and F2 generation
* no effect on birth weights, number of offspring/litter size or other parameters of reproductive success.
* WHO calculated an ADI for humans of 0.7 mg/kg/d.

Not Classifiable as a Human Carcinogen (A4).Insufficient data to recommend a skin or sensitiser notation. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| NICNAS |  | 2013 | * LD50: >2,000 mg/kg (rats, dermal)
* Negative results in skin sensitisation tests on guinea pigs
* Exposure at 1 mg/m3 aerosol (dogs, 290-d, inhalation) epithelial changes in hyperplastic foci in the respiratory region of the nasal cavity and increase in the conciliated cell numbers in the membranous portion of the trachea
* Negative results in genotoxic assay.
 |
| ECHA |  | 2011 | * LD50: male 1,420 mg/kg, female 1,630 (rats, oral)
* LC50: 5,500 mg/m3 (rats, 4 hr)
* Negative results *in vivo* and *in vitro* assays.
 |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is not a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations  |
| --- | --- |
| SWA | — |
| HCIS | — |
| NICNAS | — |
| EU Annex | NA |
| ECHA | — |
| ACGIH | Carcinogenicity – A4 |
| DFG | NA |
| SCOEL | NA |
| HCOTN | NA |
| IARC | NA |
| US NIOSH | NA |

NA = not applicable (a recommendation has not been made by this Agency); — = the Agency has assessed available data for this chemical but has not recommended any notations

### Skin notation assessment

| Calculation  |
| --- |
|

|  |  |  |  |
| --- | --- | --- | --- |
| Adverse effects in human case study: | no |   |   |
| Dermal LD50 ≤1000 mg/kg: | no |   |   |
| Dermal repeat-dose NOAEL ≤200 mg/kg: |   |   |   |
| Dermal LD50/Inhalation LD50 <10: |   |   |   |
| *In vivo* dermal absorption rate >10%: |   |   |   |
| Estimated dermal exposure at WES >10%: |   |   |   |
|   |   |   | **a skin notation is not warranted** |

 |

### IDLH

| Is there a suitable IDLH value available? | No |
| --- | --- |

## Additional information

| Molecular weight: | 190.10 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa:  | 1 ppm = Number mg/m3; 1 mg/m3 = Number ppm |
| This chemical is used as a pesticide: |[ ]
| This chemical is a biological product: |[ ]
| This chemical is a by-product of a process: |[ ]
| A biological exposure index has been recommended by these agencies: | [ ]  ACGIH [ ]  DFG [ ]  SCOEL  |

## Workplace exposure standard history

| Year | Standard |
| --- | --- |
| Click here to enter year |  |

## References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7th Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [*TLVs® and BEIs® Guidelines section*](http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations) on the ACGIH website.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (2013) Sulfites: Human health tier II assessment – IMAP report.

European Chemicals Agency (ECHA) (2020) Sodium metabisulphite – REACH assessment.